

## RAPTOR POPULATIONS ON SELECTED PARK RESERVES IN MONTGOMERY COUNTY, OHIO<sup>1</sup>

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**ABSTRACT.** A survey of raptor populations on 8 park reserves in Montgomery Co., Ohio (total area 2731 ha) was initiated in January 1981 and completed in June 1983. A total of 15 species was observed, 7 of which were nesting species, 4 were winter residents, and 4 were casual observations only. An intensive census of the nesting species yielded 54 pairs on these areas during the 1983 nesting season, which is believed to accurately reflect the total breeding population.

Important local habitats include groves of mature, planted pines (*Pinus* sp.), successional areas dominated by eastern red cedars (*Juniperus virginiana*), and old-field and meadow foraging areas. Tracts of old growth forest provided nesting areas for cavity nesting species and were particularly important where they interfaced with open habitats. The present abundance of these nesting and foraging habitats on the park reserves could account for the high concentration of nesting raptors utilizing them.

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### INTRODUCTION

The flora and fauna on the reserves of the Dayton-Montgomery County Park District are becoming increasingly isolated as surrounding land is developed or put into agricultural use. Raptor populations are known to be especially sensitive to human disturbances and environmental changes (Henny et al. 1973, Newton 1979, Craighead and Mindell 1981). General observations suggested that several raptor species have increased or decreased on these reserves during recent years, but systematically collected data were lacking. A raptor survey was begun in 1981 to determine the total population of all raptor species currently nesting or wintering on the park reserves in order to provide a base for future population studies and to identify critical habitats, thus providing a basis for sound management policies.

### STUDY AREA AND METHODS

Montgomery Co., located in the southwestern section of Ohio, is dominated by the city of Dayton and its surrounding suburbs in the east and intensive agriculture in the west. The entire county is

glaciated, the bedrock consisting primarily of Ordovician and Silurian limestones and shales. Beech and oak-sugar maple forests covered a majority of the county before settlement (Gordon 1966).

This project was begun in 1981 on 4 park reserves and expanded to 13 in 1982. At the conclusion of the 1983 season, a count of the number of breeding pairs was completed on 8 of these areas, and the present status of every species observed on them was documented. These 8 reserves are scattered throughout the county (fig. 1) and vary considerably in size and habitat composition (table 1).

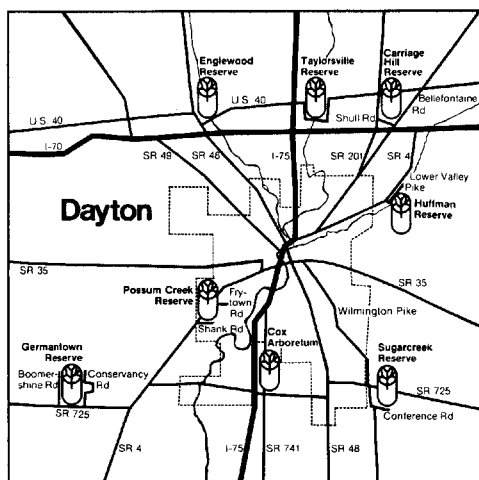


FIGURE 1. Location of study areas in Montgomery County, Ohio.

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TABLE 1  
Habitat composition of study areas (Montgomery Co., OH) from Mutter and Powder (1980).

	Carriage Hill Reserve	Cox Arboretum	Englewood Reserve*†	Germanatown Reserve†	Huffman Reserve†	Possum Creek Reserve	Sugarcreek Reserve	Taylorville Reserve†	Total Area ha (acres)	Total Percentage
% young forest/thicket	15	35	29	18	22	44	30	24	692 (1708)	25
% meadow/old-field/prairie	51	4	23	36	2	22	28	9	691 (1706)	25
% mature upland forest	12	22	13	28	6	7	24	18	466 (1150)	17
% mature flood-plain forest	0	0	7	8	29	4	10	15	244 (604)	9
% developed	8	38	10	4	24	5	2	7	233 (574)	9
% cropland	9	0	2	2	0	9	2	22	185 (456)	7
% lakes/streams	2	1	9	1	16	6	2	3	132 (330)	5
% pasture	3	0	6	0	0	2	2	0	59 (144)	2
% pines/mature cedars	0	0	1	3	1	0	0	1	129 (73)	1
Total area ha (acres)	323 (797)	69 (170)	666 (1644)	570 (1410)	160 (395)	235 (579)	239 (592)	469 (1157)	2731 (6745)	

\* Includes Aullwood Audubon Center and Farm

† Includes adjacent property owned by the Miami Conservancy District

Each reserve was censused a minimum of 2 times per month from 1 December through 31 May each year by trained volunteers and staff of the Dayton-Montgomery County Park District. Smaller reserves were covered by a single pair of observers while larger reserves were divided into sections, each of which had a corresponding pair of observers. Section size depended on the difficulty of the terrain and composition of the vegetative cover but was usually from 1–2 km<sup>2</sup>. In this way all reserves received comparable coverage. Observers walked randomly through their assigned section and recorded any sign of raptor activity including stick nests, potential nesting cavities, whitewash, pellets, roosting sites, and "butcher blocks" as well as direct visual and vocal observations. Each census lasted between 2 and 4 hrs. On many occasions observations made by the volunteers served to identify potential nesting areas, but the exact nest site was found or verified by one of the authors.

In addition, night surveys were conducted at irregular intervals throughout the study period (usually on calm, clear nights) on each of the 8 study areas by the authors to collect additional data on owl populations. The daytime census proved to be ineffective in locating eastern screech owls (*Otus asio*)

since these birds roost and nest exclusively in tree cavities and woodpecker holes (VanCamp and Henny 1975). In addition, barred owls (*Strix varia*), while often observed during the day, were easily overlooked in large forest tracts. Taped recordings of owl calls were used to induce vocal responses. Although the night census did not locate any confirmed nest sites in 1983, juvenile eastern screech owls were found in several areas where adults had responded earlier to recorded calls. Similar techniques have been shown to be effective in other studies (Andrews et al. 1982, Rusch et al. 1972). However, the actual screech owl nesting populations may be somewhat larger than listed in table 2 since this system tended to underestimate populations in areas close to major highways (due to excessive background noise) and remote sections which, unlike the daytime census, were not visited as often as accessible areas.

## RESULTS AND DISCUSSION

Seven raptor species currently nest on the study areas, and an additional 8 species were winter residents or transients (table 3). A total of 27 confirmed and 27 "probable" nest sites were located during the 1983

TABLE 2  
Number of confirmed and probable nests on study areas in 1983 season.

	Carriage Hill Reserve	Cox Arboretum	Englewood Reserve	Germantown Reserve	Huffman Reserve	Possum Creek Reserve	Sugarcreek Reserve	Taylorville Reserve	# confirmed nest sites	# probable nest sites	Total
Cooper's hawk ( <i>Accipiter cooperii</i> )	X*		2	2		X	1	2	7	0	7
Red-tailed hawk ( <i>Buteo jamaicensis</i> )	1	X**	1	2	X	X**	1	X	5	0	5
Broad-winged hawk ( <i>Buteo platypterus</i> )		X	1	1				X	0	2	2
American kestrel ( <i>Falco sparverius</i> )	1	X	2	2	1	1	1	2	9	1	10
Eastern screech owl ( <i>Otus asio</i> )	2		2	1	2	3	3	2	0	15	15
Great horned owl ( <i>Bubo virginianus</i> )	X	1	2	1	1	2	X	2	6	3	9
Barred owl ( <i>Strix varia</i> )			2	2			1	1	0	6	6
Total	4	1	12	11	4	6	7	9	27	27	54

\*X = species observed on area during nesting season, but no nesting activity observed

\*\*Species nested on area in 1982 but not 1983

season (table 2). Probable nest sites were areas on which a breeding pair was evident, but the actual nest site was not located. Such sites were designated "probable" only if repeated observations of paired birds, courtship displays, or territorial behavior (including response to taped calls) occurred in a specific location containing suitable habitat. The majority of these pairs was eastern screech and barred owls, whose nests usually occur in tree cavities and can be very difficult to locate.

This study clearly illustrated the importance of several habitats to local raptor populations. Groves of pines (*Pinus* sp.), most of which were planted in the 1930s, were often utilized by great horned (*Bubo virginianus*) and barred owls for winter roosting sites. Although these groves comprise less than 1% of the total study area (table 1), they contained 6 of the 7 Cooper's hawk (*Accipiter cooperii*) nests and evidently provide this species with its preferred nesting habitat on the park reserves.

Successional areas which were dominated by eastern red cedars (*Juniperus*

*virginiana*) provided important winter roosting sites for northern saw-whet (*Aegolius acadicus*) and long-eared (*Asio otus*) owls. All of the saw-whet sightings were in areas containing scattered small or medium-sized cedars which were surrounded by low deciduous growth. Two of the 3 long-eared owl roosts (all of them in Germantown Reserve) were located in stands of large cedars, the third in a stand of young pines.

Old-field and meadow habitats currently dominate a large portion of many of the park reserves (table 1). Studies have shown that these habitats support high prey densities and are heavily utilized by raptors, while plowed agricultural fields and developed land (which predominate around most of the park borders) support virtually no prey and are seldom used (Baker and Brooks 1981, Craighead and Craighead 1956).

Tracts of old growth forest were especially important to cavity nesting species. All of the eastern screech owl nest areas occurred where old "den" trees containing

TABLE 3  
Raptor species observed on the 8 study areas  
in 1983 season.

	Nesting Species	Winter Resident	Casual Observation
Northern goshawk <i>Accipiter gentillis</i>			X
Sharp-shinned hawk <i>Accipiter striatus</i>		X	
Cooper's hawk <i>Accipiter cooperii</i>	X		
Red-tailed hawk <i>Buteo jamaicensis</i>	X		
Red-shouldered hawk <i>Buteo lineatus</i>			X
Broad-winged hawk <i>Buteo platyterus</i>	X		
Rough-legged hawk <i>Buteo lagopus</i>			X
Northern harrier <i>Circus cyaneus</i>		X	
Osprey <i>Pandion haliaetus</i>			X
American kestrel <i>Falco sparverius</i>	X		
Eastern screech owl <i>Otus asio</i>	X		
Great horned owl <i>Bubo virginianus</i>	X		
Barred owl <i>Strix varia</i>	X		
Long-eared owl <i>Asio otus</i>		X	
Northern saw-whet owl <i>Aegolius acadicus</i>		X	

suitable nesting cavities interfaced with open foraging habitats. Similarly, great horned owl nests were located in tracts of old growth forest which were adjacent to meadow/old-field habitats. All but 1 of these nests were in cavities; the remainder was in an old red-tailed hawk (*Buteo jamaicensis*) nest. Barred owl nest areas were

located in large tracts of old growth upland forest which were adjacent to a floodplain.

It appears that the reserves of the Dayton-Montgomery County Park District are providing valuable foraging and nesting sites for local raptor populations. This study revealed a total of 54 pairs of nesting raptors on a 27-km<sup>2</sup> total area (2.0 pairs/km<sup>2</sup>). The present concentration of raptor foraging and nesting habitats, particularly the old-field/meadow and old growth forest communities on the park reserves, could account for this concentration of nesting raptors.

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